

JAPAN

EDICT OF GOVERNMENT

In order to promote public education and public safety, equal justice for all, a better informed citizenry, the rule of law, world trade and world peace, this legal document is hereby made available on a noncommercial basis, as it is the right of all humans to know and speak the laws that govern them.

JIS B 9113 (1989) (English): Power sprayers

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*The citizens of a nation must
honor the laws of the land.*

Fukuzawa Yukichi

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JAPANESE INDUSTRIAL STANDARD

Power Sprayers

 **JIS B 9113**—1989

Translated and Published

by

Japanese Standards Association

In the event of any doubt arising,
the original Standard in Japanese is to be final authority.

JAPANESE INDUSTRIAL STANDARD
JIS B 9113-1989
Power sprayers

May, 1996

ERRATA

Page	Position	Wrong	Correct
1	Subclause 2.1(1)	$\eta_p = 2.96 \times 10^{-6} \times \frac{V_n P}{B} \times 100$	$\eta_p = \frac{1}{60} \times \frac{V_n P}{B} \times 100$
		$V_o = \frac{\pi}{4} D^2 L_{n,n}$	$V_o = \frac{\pi}{4} D^2 L_{n,n} \times 10^{-3}$

Remarks: This errata is for correcting the first edition of this Standard.
Japanese Standards Association

JAPANESE INDUSTRIAL STANDARD

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Power Sprayers

B 9113-1989

1. Scope

This Japanese Industrial Standard specifies the reciprocating pump type power sprayers (hereafter referred to as the "sprayers") for agricultural use and epidemic prevention use. However, prime movers are not included.

Remark: The units and numerical values given in { } in this Standard are based on the traditional unit and are appended for informative reference.

2. Performances

2.1 Volumetric Efficiency and Pump Efficiency The efficiency of the sprayer at the marked normal pressure and the marked speed of rotation shall be as specified in the following:

- (1) For Marked Capacity ⁽¹⁾ 6 l/min or Over The volumetric efficiency shall be 93 % or over and the pump efficiency shall be 63 % or over.

Further, the volumetric efficiency and pump efficiency shall be obtained from the following formula:

$$\eta_v = \frac{V_n}{V_0} \times 100$$

$$\eta_p = 2.96 \times 10^{-6} \times \frac{V_n P}{B} \times 100$$

$$\{ \eta_p = \frac{V_n P}{450 B} \times 100 \}$$

where, η_v : volumetric efficiency (%)

η_p : pump efficiency (%)

V_0 : calculated delivery volume at marked speed of rotation (l/min)

$$V_0 = \frac{\pi}{4} D^2 L n_i n$$

D : pump cylinder diameter (cm)

L : actual stroke length (cm)

n_i : marked speed of rotation (min⁻¹) (rpm)

n : number of cylinders of pump

V_n : delivery at marked normal pressure and marked speed of rotation (l/min)

P : delivery pressure (MPa) {kgf/cm²}

B : brake horsepower (kW) {PS}.

- (2) For Marked Capacity (¹) under 6 l/min The volumetric efficiency shall be 88 % or over, and the pump efficiency shall be 50 % or over.

Note (¹) The capacity shall be defined as the calculated volume of delivery, with its decimals discarded, at the marked speed of rotation. However, in the case of under 20 l/min, it may be taken as the calculated volume of delivery with its second place of decimals discarded.

2.2 Running Conditions The running conditions of the sprayer shall be as specified in the following:

- (1) When the sprayer has been run for 1 h continuously, there shall be no abnormal generation of heat, vibration and noises, and there shall be no water leakage impedimental to use.
- (2) When accessories have been mounted, there shall be no water leakage in connecting portions, and the spraying conditions shall be so excellent as not to constitute impediment to use.

3. Construction, Shapes and Dimensions

3.1 Construction The sprayer shall have sufficient strength and, when running at the maximum speed of rotation at the marked maximum pressure, shall show no significant strain.

In addition, its construction shall facilitate the control and operation of pressure as well as accurate operation.

3.2 Shapes The shapes of the sprayers shall generally be in accordance with Attached Figure.

3.3 Cylinder, Air Chamber and Pressure Regulating Valve The cylinder, air chamber and pressure regulating valve of the sprayer shall be as follows:

- (1) The cylinder, when subjected to water pressure 2 times the marked maximum pressure (6 MPa {60 kgf/cm²} in the case where 2 times the marked maximum pressure is less than 6 MPa {60 kgf/cm²}) for 30 s, shall be free from abnormalities.
- (2) The air chamber, when subjected to water pressure 3 times the marked maximum pressure (7 MPa {70 kgf/cm²} in the case where 3 times the marked maximum pressure is less than 7 MPa {70 kgf/cm²}) for 30 s, shall be free from abnormalities.
- (3) The pressure regulating valve shall be reliable in function, and its pressure shall never exceed the limit of 1.2 times the marked maximum pressure.

3.4 Rotating Shaft The shaft diameter of the input shaft of the sprayer shall be in accordance with JIS B 0901.

3.5 Accessories In the case where the accessories are to be mounted, they shall be in accordance with the following.

- (1) The spraying pipe (nozzle and nozzle pipe) shall sufficiently withstand the spraying pressure and be free from water leakage.
- (2) The hose coupling and joint shall be in accordance with JIS B 9119.
- (3) The cock shall be in accordance with JIS B 9121.
- (4) The hose for spraying shall be that specified in JIS K 6339 or JIS K 6765, or that equal or superior in quality.

4. Appearance

The sprayer shall be well finished and painted, and be free from defects injurious to use such as flaws, cracks, rust, burrs and blowholes.

5. Materials

The materials of the principal parts of the sprayer shall be those given in Table or those equal or superior to them in quality.

Table. Materials

Name of part	Material
Crank shaft	SF 40 of JIS G 3201 S 48 C of JIS G 4051 SCM 435 of JIS G 4105 FCD 450 of JIS G 5502
Connecting rod	SF 40 of JIS G 3201 FCMB 340 of JIS G 5702 C 3771 BE . BD of JIS H 3250 BC 2, BC 3 or BC 6 of JIS H 5111 AC 5 A of JIS H 5202 ZDC 1 or ZDC 2 of JIS H 5301 ADC 12 of JIS H 5302
Piston pin or plunger pin	S 40 C of JIS G 4051 SCM 415 of JIS G 4105 SUJ 2 or SUJ 3 of JIS G 4805
Cylinder	That specified in JIS G 3459 That specified in JIS G 4305 C 3771 BE and BD of JIS H 3250 YBSC 3 of JIS H 5101 BC 1, BC 2, BC 3 or BC 6 of JIS H 5111 That thermal-sprayed in accordance with JIS H 8304 on SUS 304 TP of JIS G 3459 Ceramics ⁽²⁾
Piston or plunger	That specified in JIS G 3459 SUS 304 of JIS G 4303 That specified in JIS G 4305 C 2600 T of JIS H 3300 BC 2 of JIS H 5111 Ceramics ⁽²⁾
Valve and valve seat	SUS 304 or SUS 440 C of JIS G 4303 That specified in JIS G 4305 C 3771 BE and BD of JIS G 3250 BC 3 of JIS H 5111 Ceramics ⁽²⁾
Air chamber	SPCC of JIS G 3141 STPG 38 of JIS G 3454 That specified in JIS G 3459 That specified in JIS G 4305 C 2600 T of JIS H 3300 YBSC 3 of JIS H 5101 BC 2, BC 3 or BC 6 of JIS H 5111

Note ⁽²⁾ That equal to or superior to that specified in JIS H 8304 in hardness.

6. Inspection

The inspection of the sprayer shall be carried out on performances, construction, shapes, dimensions, appearance and materials, and the results shall conform to the requirements of 2. to 5.

7. Formal Naming

The sprayer shall be designated by the Standard number or title.

8. Marking

The sprayer shall be marked with the following details.

- (1) Manufacturer's name or its abbreviation
- (2) Year and month of manufacture or its abbreviation
- (3) Required power (kW) {PS}
- (4) Maximum pressure (MPa) {kgf/cm²}
- (5) Working pressure (MPa) {kgf/cm²}
- (6) Speed of rotation (min⁻¹) {rpm}
- (7) Capacity (l) (l).

Applicable Standards:

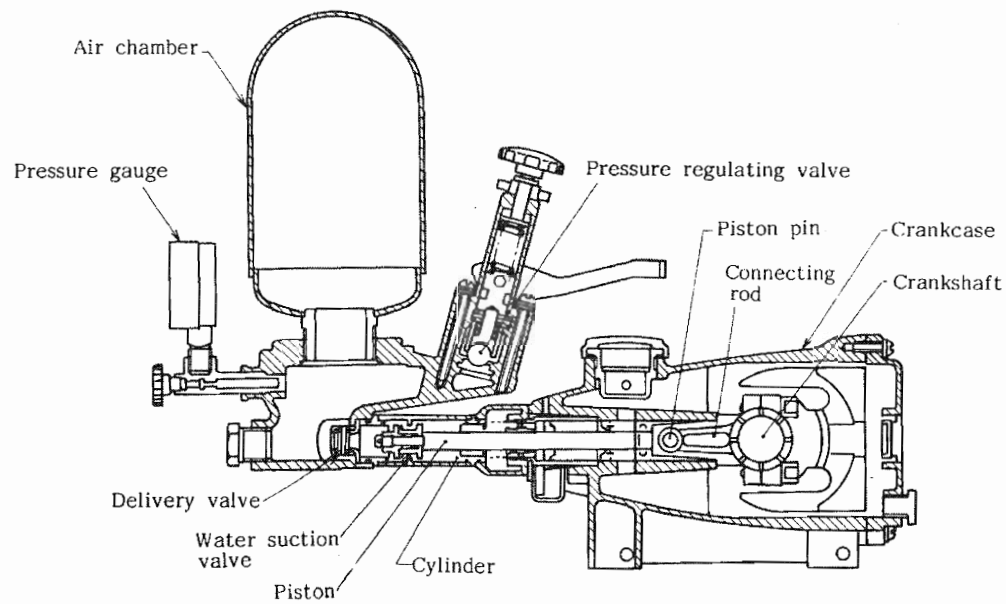
JIS B 0901-Diameter of Shafts
JIS B 9119-Hose Couplings and Hose Joints for Sprayer
JIS B 9121-Cocks for Sprayer
JIS G 3141-Cold Rolled Carbon Steel Sheets and Strip
JIS G 3201-Carbon Steel Forgings for General Use
JIS G 3454-Carbon Steel Pipes for Pressure Service
JIS G 3459-Stainless Steel Pipes
JIS G 4051-Carbon Steels for Machine Structural Use
JIS G 4105-Chromium Molybdenum Steels
JIS G 4303-Stainless Steel Bars
JIS G 4305-Cold Rolled Stainless Steel Plates and Sheets
JIS G 4805-High Carbon Chromium Bearing Steels
JIS G 5502-Spheroidal Graphite Iron Castings
JIS G 5702-Blackheart Malleable Iron Castings
JIS H 3250-Copper and Copper Alloy-Rods and Bars
JIS H 3300-Copper and Copper Alloy-Seamless Pipes and Tubes
JIS H 5101-Brass Castings
JIS H 5111-Bronze Castings
JIS H 5202-Aluminium Alloy Castings
JIS H 5301-Zinc Alloy Die Castings
JIS H 5302-Aluminium Alloy Die Castings
JIS H 8304-Thermal Sprayed Ceramic Coatings
JIS K 6339-Spray Hoses for Agricultural Use
JIS K 6765-Polyethylene Sprayer Hoses

Reference Standard:

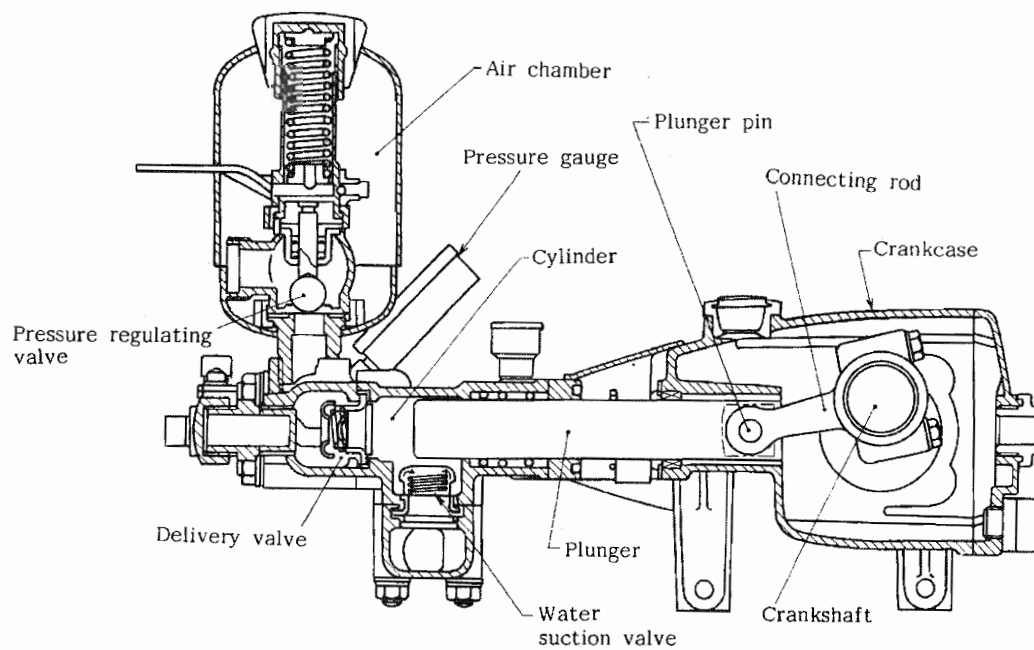
JIS B 8311-Testing Methods for Reciprocating Pumps

Attached Figure. Shapes of Sprayers

Piston Type



Plunger Type



B 9113-1989
Edition 1

Japanese Text

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